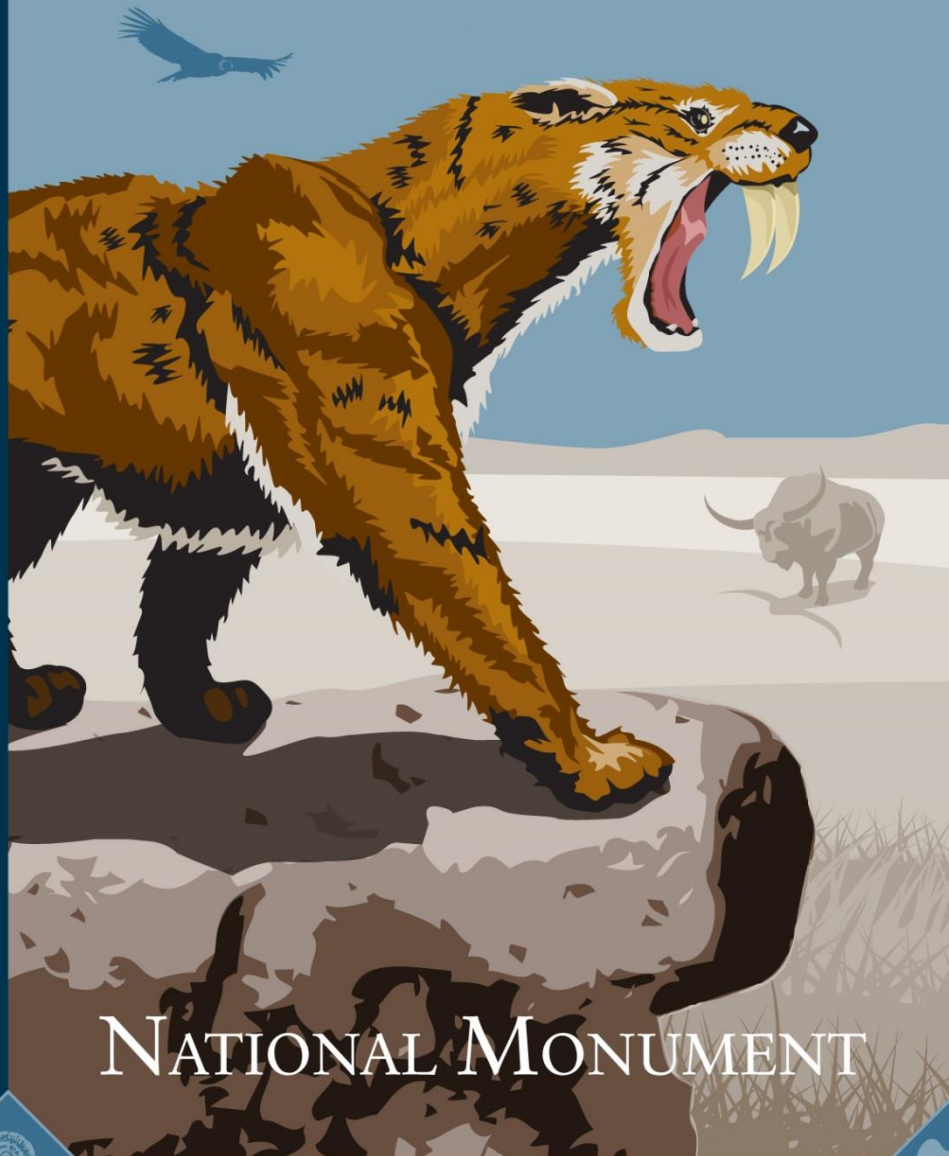


Teacher Resources

TULE SPRINGS FOSSIL BEDS



NATIONAL MONUMENT

3rd – 5th Grade



Tule Springs Fossil Beds National Monument is one of our newest National Park Service sites and it is located right here in the Las Vegas Valley. The National Park Service and our partners, the Protectors of Tule Springs, are pleased to be a great resource for teachers looking for innovative ways to teach topics through the amazing resources of this fossil site.

The park preserves an amazing collection of fossil sites that have the potential to help us learn about a specific segment of the Pleistocene Era, also referred to as the Ice Age. Within the chalky soils of the park a wide range of animals are preserved. They include large, iconic animals like Columbian Mammoth, Shasta Ground Sloth, two extinct species of Bison, camel, and horses. These animals were drawn here at a time where the climate was cooler and damper and supported a variety of plants fed by spring waters. Where there are plant eaters, there are meat eaters. Saber-toothed cats, American lions, and dire wolves were fierce and canny predators. All of these animals are found in the soils of Tule Springs and many have been collected by paleontologists.

The park is in its infancy. It does not have a visitor center or facilities. We are entering the planning phase to determine what this national park site should offer. Undoubtedly, there will be a curriculum-based education program. We will need the assistance of dedicated teachers, like you, to help develop this curriculum so that it meets your needs.

Within this packet are some grade-specific activities that will allow you to introduce the idea that right here in our own backyard, fossils are preserved that tell us much about the world in which we live. We hope you find time to introduce the park to your students and we look forward to working with you on this exciting endeavor. We are grateful to the Waco Mammoth National Monument and Clark County educators for permission to use their activities.



Ice Age Investigation

3rd - 4th Grade

Concepts

- Fossils give us evidence about extinct animals.
- Scientists can learn how extinct animals lived by observing their adaptations and comparing them to living animals.

Objectives

- Students will understand that the fossils from Tule Springs teach us about life in Las Vegas during the Ice Age.
- Students will understand that many Ice Age animals are similar to animals that still live today.

Outline

Students will select one animal and use their research to compose a short paragraph about how that animal lived.

Review the idea that fossils give scientists evidence about plants and animals that lived a long time ago. The fossils from the Tule Springs give us information about what life was like in Las Vegas during the Ice Age. We can draw information from fossils by making careful observations and using what we already know about animals who are alive today.

Ice Age Investigation

The extinct animals from Tule Springs can tell us a lot about the way the animals lived by examining their fossil remains. From the smallest mouse to the largest mammoth, the story of their life is in their bones. Read and research about the animals of the Ice Age and see if you can uncover the mysteries!

Choose one of the animals from your reading, and use your research and observations to fill in the paragraph.

I chose to study the _____.

My animal is _____ in size compared to other animals of the Ice Age.

Its teeth are _____ which tells me that it ate _____.

It walks on _____ legs.

My animal looks like it moved _____ because _____
_____.

A living animal similar to my animal is the _____.

Draw your animal:



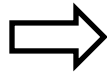
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Pleistocene Food Scene

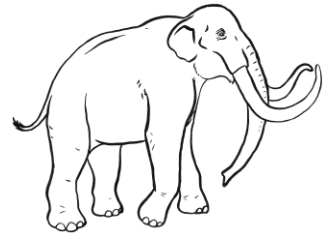
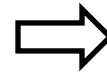
Circle the correct answer to complete each food chain.



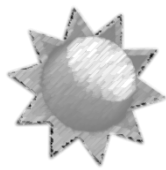
Sun



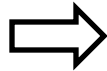
- A. Snail
- B. Algae
- C. Chicken
- D. Grass



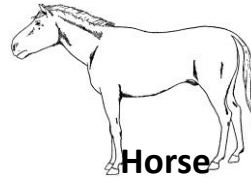
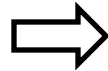
Mammoth



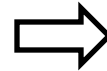
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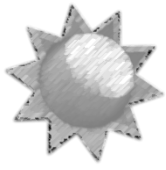
Grass



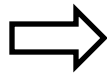
Horse



- A. Deer
- B. Sabertooth Cat
- C. Tree
- D. Spider



Sun



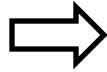
- A. Tree
- B. Human
- C. Mammoth
- D. Rabbit



Ground Sloth



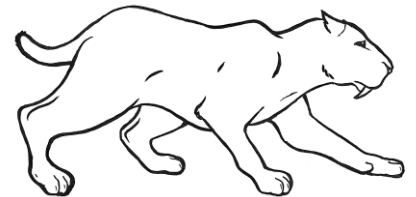
Sun



Grass



- A. Snake
- B. Human
- C. Deer
- D. Clam



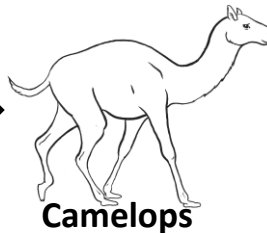
Sabertooth Cat



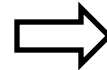
Sun



Grass



Camelops



- A. Tortoise
- B. Rabbit
- C. Horse
- D. Lion



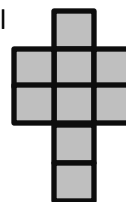
Name: _____ Date: _____



Measure the lengths of the sides to find the perimeter of each shape.

Count the number of squares to find the area of each shape.

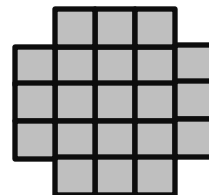
1. Shovel



Perimeter: _____

Area: _____

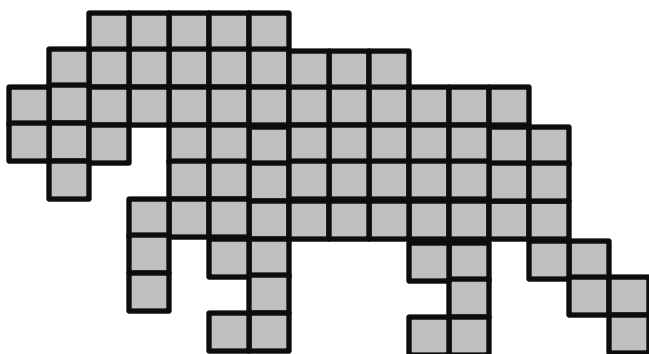
2. Compass



Perimeter: _____

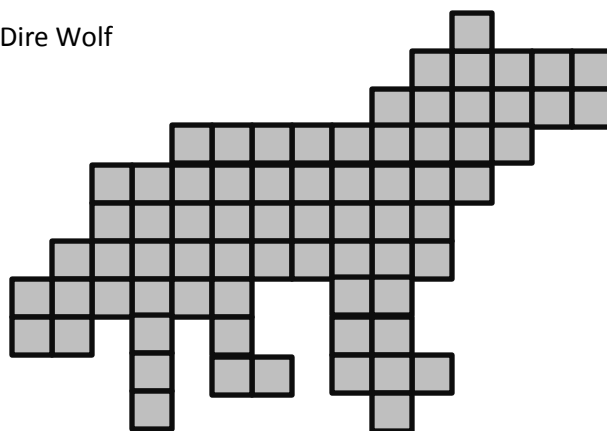
Area: _____

3. Smillodon



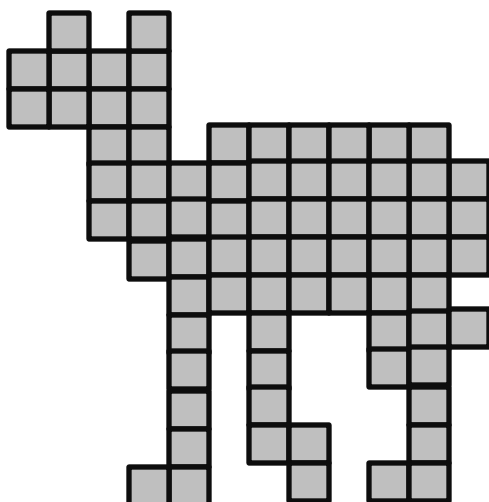
Perimeter: _____ Area: _____

4. Dire Wolf



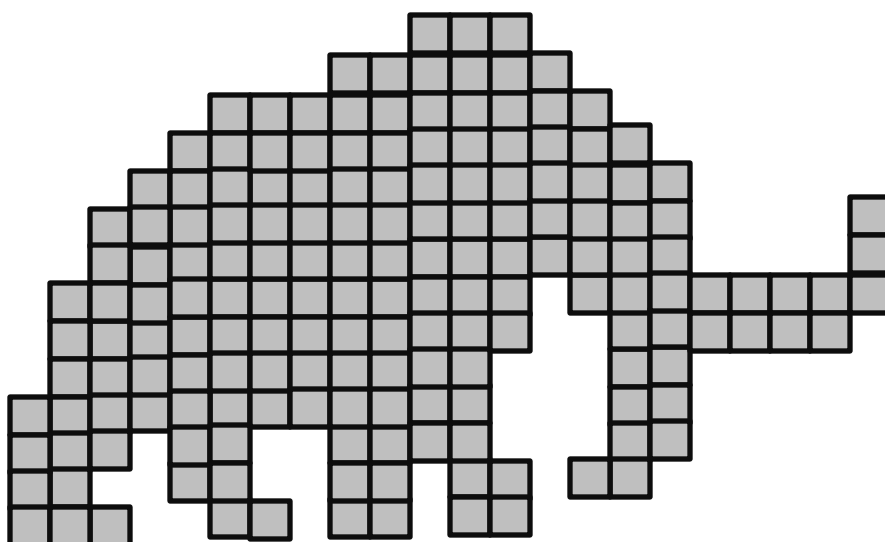
Perimeter: _____ Area: _____

5. Camelops



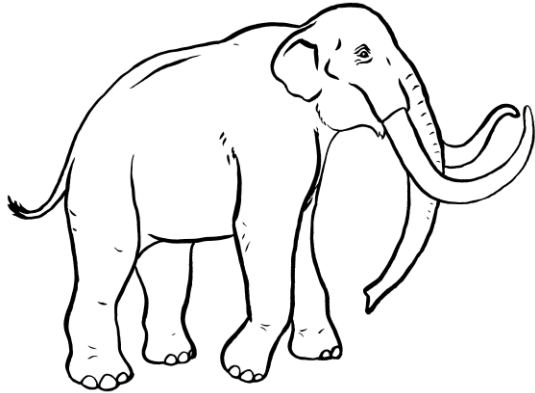
Perimeter: _____ Area: _____

Bonus – Columbian Mammoth



Perimeter: _____ Area: _____

Name: _____ Date: _____



Columbian Mammoths: Giants of the Ice Age

Did you know not all mammoths were woolly mammoths? The woolly mammoth was just one of nearly a dozen different species of mammoths. Another species was the Columbian (pronounced “cuh-LUM-be-un”) mammoth.

Columbian mammoths lived during the Pleistocene Epoch (“PLY-stuh-SEEN EP-uck”), sometimes called the Ice Age. The Pleistocene Epoch started 2.5 million years ago and ended about 10,000 years ago. Even though people call it the Ice Age, not all the world was covered in ice. Sheets of ice called glaciers (“GLAY-shurs”) covered most of what is now Canada and the northern United States, but the lands that became the southern United States and Mexico were not under ice.

Columbian mammoths were grazers, or animals that eat mostly grass. To make sure they had enough to eat, they lived in savannas (“suh-VAN-uhs”). Savannas are warm grasslands with scattered trees, and they were away from the glaciers. This was different from the woolly mammoths, which lived closer to the glaciers in lands called steppes (“STEPS”), cool plains with shrubs, herbs, and a little grass.

How big was a Columbian mammoth? Huge! They were about 14 feet tall, or 4.3 meters. They also weighed as much as 10 tons, the same as a school bus. This made them much bigger than woolly mammoths, which were about 10 feet tall (3 meters) and weighed 6 tons.

So why were they called Columbian mammoths? Scientists use New Latin to name animals. In New Latin, “Columbia” means “land of Columbus”, or North America. Columbian mammoths lived in North America and nowhere else, so this is a good name. Most Columbian mammoth fossils have been found in the United States or Mexico.

- 1.What is another name for the Ice Age?
- 2.What do grazers eat?
- 3.What does “Columbia” mean?
- 4.What is the difference between a savanna and a steppe?
- 5.List three differences between Columbian mammoths and woolly mammoths.

Fossil Evidence Lesson

Lesson Plan by Shannon Hale

Standards: 3-LS4-1: Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.

Science and Engineering Practices: Analyzing and interpreting data

Disciplinary Core Idea: Evidence of common ancestry

Crosscutting Concepts: Systems and system models

Knowledge Learning Targets: Students will understand that some living organisms resemble organisms that once lived on Earth. Fossils provide evidence about the types of organisms and environments that existed long ago.

Performance Learning Targets: Students will be able to analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.

Lesson Length: Five 50-minute lessons (some reading and/or writing time can be utilized)

Introduction: Teacher will present the definition of a fossil as a remnant, impression, or trace of an organism of past geologic ages that has been preserved in the earth's crust.

Suggested Sequence of the Lesson:

ENGAGE:

- 1) Watch "All About Fossils" (21:23) video from the Structures of Life unit on Fossweb.com. It's under "Digital-Only Resources" and "Streaming Videos".
- 2) Students will take notes while watching.

EXPLORATION:

- 1) Students will read the article "How is a Fossil Formed" and complete the sequencing activity. ("Fossils are Fantastic" by The Blessed Teacher on [teacherspayteachers.com](https://www.teacherspayteachers.com)-\$3.00)
- 2) Students will get a chocolate chip cookie, paper clip to bend, and a paper plate to complete "A Cookie 'Fossil' Dig" activity. ("Fossils are Fantastic" by The Blessed Teacher on [teacherspayteachers.com](https://www.teacherspayteachers.com)-\$3.00)
- 3) Students will get a large piece of construction paper and fold it into four parts.
- 4) Definitions will be given and students will record the four types of fossils (trace, mold, cast, and true form). ("Four Types of Fossils Project ~ Hands-on Activity with Fossils!" by Smart Chick on [teacherspayteachers.com](https://www.teacherspayteachers.com)-\$2.50)
- 5) Students will make models of the four types of fossils, using clay and plastic dinosaurs or shells. (on Amazon.com, 72 count of dinosaurs is \$8.65)

Trace Fossils



They show evidence of activity.

Scientists use these fossils to study animal behavior.

Mold



- They show evidence of the animal's activity.
- Once the animal is dissolved, the mold remains in the rock.

EXPLANATION

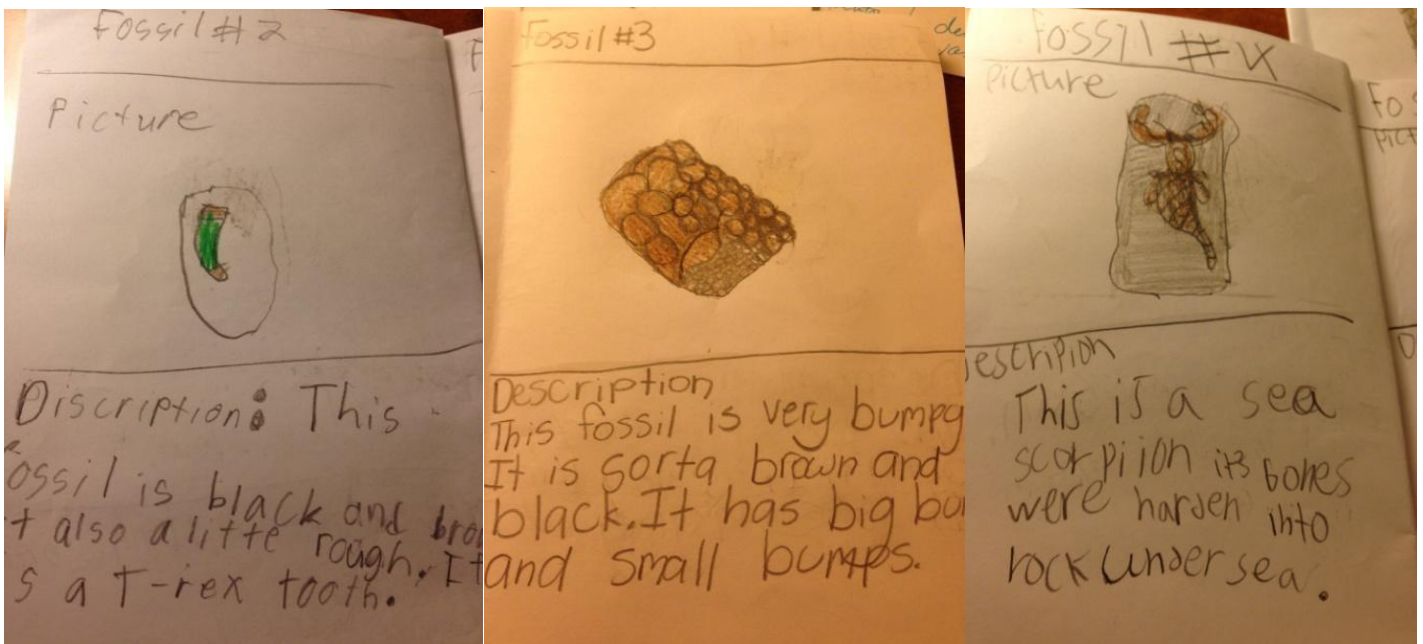
1) Class will look at the world map with symbols that represent where dinosaur fossils have been found and discuss where the most have been found, where the least have been found, and inferences that can be made.



- 2) Students will read the Time for Kids article "Digging Up the Past".
- 3) Partners will work together to complete the "Bone Up on Fossils" worksheet. (This will be graded.)

ELABORATION

- 1) Paper booklets and plastic fossils in egg cartons will be distributed to each team (on Amazon.com, 48 count of plastic fossils is \$28.90)
- 2) Students will work together in teams of 4-6 to create fossil guides. This can be done individually or as a group, depending on time and supplies. (<http://pals.sri.com/tasks/k-4/Fossil/admin.html> and <http://pals.sri.com/tasks/k-4/Fossil/directs.html> --click on the gold bar at the top for a rubric and examples of student work)



EVALUATION

- 1) Each student will choose one of the plastic fossils.
- 2) Students will complete the writing assignment about the organism's life and how it became a fossil. (This will be graded.)



Digging Up the Past

Paleontologist Mark Norell's job takes him around the world. He has made many discoveries about dinosaurs.

SEP 11, 2015 | By Melanie Kletter

The Gobi Desert, in Central Asia, is a large and remote place. In the winter, it is extremely cold. In the summer, it is scorching hot. But for paleontologist Mark Norell, Gobi is paradise. Norell is the chairman of the paleontology division at the American Museum of Natural History (AMNH), in New York City. He returned to New York in mid-August from collecting fossils in the desert. "Of the five great places to find dinosaurs in the world, Gobi remains the least explored," Norell told TFK. "It is one of the world's best locations for finding fossils."

For the past 25 years, Norell has spent part of each summer in Gobi. His discoveries have changed the way that scientists think about dinosaurs and other animals. Paleontologist Shaena Montanari has worked closely with Norell. She says one fossil Norell found clearly shows the link between dinosaurs and birds.

A Life in Science

As a child, Norell was interested in science and history. He went on to study zoology and biology. A love of camping and traveling led him to choose a field where he could sometimes work outdoors.

In his job at the AMNH, Norell spends much of his time doing research. He is in charge of a team of paleontologists. They study birds, lizards, and the connections between dinosaurs and those animals.

Norell also works closely with other types of scientists. "Everyone has a different strength and expertise," he says.

In addition to his research, Norell creates AMNH exhibits about dinosaurs and other topics. One exhibit was called The World's Largest Dinosaurs. Paleontologists use tools that have been used for hundreds of years, such as shovels and picks. But technology has become a key part of the profession. Norell does much of his work on a computer.

Norell clearly enjoys his job. "What I love about paleontology is that the field is always changing," he says. "There is a lot of creativity that goes along with it."

Dinosaur: Tyrannosaurus Rex

Period: Cretaceous

When: 65 million to 144 million years ago

About this period: Many types of dinosaurs appeared. So did new types of mammals and birds. Big flying reptiles became even larger. T. rex was a carnivore, or meat eater. With powerful jaws that could open very wide and sharp teeth and claws, T. rex was a fierce predator.


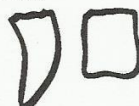

To access the digital edition of TIME For Kids, go to timeforkids.com/digital.

[« Back to Article](#)

Name _____ Date _____

Bone Up on Fossils

Paleontologists study fossils to learn how dinosaurs lived long ago. Read the chart to find out what a paleontologist might learn from three fossil types. Then answer the questions.

FOSSIL TYPE	OBSERVATIONS	CONCLUSIONS
Eggs 	<ul style="list-style-type: none"> • Many eggs packed in one area • Dino eggs near fossils of adult and young dinosaurs 	<ul style="list-style-type: none"> • Dinosaurs built nests. • Adult dinosaurs took care of their young.
Teeth 	<ul style="list-style-type: none"> • Short, flat teeth • Long, sharp, pointed teeth 	<ul style="list-style-type: none"> • Short, flat teeth belong to herbivores, or plant eaters. These teeth cannot tear meat. • Long, sharp, pointed teeth belong to carnivores, or meat eaters. These teeth can slice through meat.
Tracks 	<ul style="list-style-type: none"> • Many of the same type of tracks moving in the same direction • Large distance between footprints 	<ul style="list-style-type: none"> • These dinosaurs traveled in groups. • These dinosaurs moved fast.

1. Which type of fossil gives clues about dinosaurs and their young? _____
2. How can scientists tell the difference between meat-eating dinosaurs and plant-eating dinosaurs? _____
3. What is one way that scientists can learn how fast a dinosaur moved? _____
4. What might be a clue that a dinosaur moved slowly? _____
5. What information can scientists get from studying dinosaur bones? Write two ideas.

Bonus What are some clues that an animal has visited a backyard or park? Make a list on the back of this page. Then write what these clues can tell us about the animal.

Name _____ Date _____

Directions:

- 1) Choose one of the fossils and draw it in the box.
- 2) What type of fossil is it? (trace, mold, cast, true form)
- 3) Write a realistic fiction story about the organism's life, how its life ended, and then how it became a fossil.